

REMARKS

Claims 1-27 were previously pending in this application. By this amendment, Applicant is canceling claims 6-10 and 22-27 without prejudice or disclaimer. Claims 1-5, 12-15, 16, and 20-21 have been amended in a non-narrowing manner to further define the claimed invention and not to distinguish over the prior art. New claims 28-47 have been added. As a result, claims 1-5, 11-21, and 28-47 are pending for examination with claims 16, 29, 37, and 45 being independent claims. No new matter has been added.

Rejections under 35 U.S.C. § 103 – Claims 1-7, 10, 11, 13-18, 21-24, and 27

Claims 1-7, 10, 11, 13-18, 21-24, and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,650,460, to Kurematsu [hereinafter Kurematsu] and U.S. Patent No. 5,640,470, to Hegg et al. [hereinafter Hegg]. Applicant traverses this rejection as follows.

Kurematsu, as shown in Fig. 1, is directed to a projection type display. Three single color illumination units 1G, 1R, 1B direct light components through three collimator lenses 20 toward a concave reflecting mirror 21. A reflecting mirror 21 then reflects each component of light at a different angle of incidence towards an actuated mirror array 3. The pixel components of the actuated mirror array 3 then reflect selected light components toward the entrance aperture of the optical system 4. (See Kurematsu, Col. 5, lines 41-52).

Hegg, as shown in Fig. 5, is directed to a digital micromirror device. The light source and reflector 60 direct light through a condenser lens 62, through a color wheel 64, and through a collimating lens 68. A light separator 70 with a reflective surface 72 bends the light through a wedge 78 towards a digital micromirror device 76. (See Hegg, Col. 5, lines 50-65). The wedge 78 is formed from a bundle of closely packed optical fibers which are aligned with the axis of the lens system 85. The lens system 85 receives light transmitted through the optical fibers from the micromirror device and through the surface 72. The light from the lens system is then displayed upon a suitable display device 86. (See Hegg, Col. 6, lines 1-15).

The Examiner suggests the desirability of modifying or combining the invention of Kurematsu in view of Hegg. Applicant respectfully disagrees with the Examiner that the references can be combined. Specifically, Kurematsu uses a concave mirror 21 to provide a separate angle of incidence to each light component (R, G, B) as each illuminates the AMA 3. (See Kurematsu, Col. 5, lines 41-48). In this manner, Kurematsu requires that the colored light components be spatially modulated with an angular separation before being transmitted to the AMA. In contrast, Hegg uses a wedge of optical fibers 78 which only transmits light to the micromirrors 76 if the incident light is parallel light to the length of the optical fibers. In this manner, the necessarily non-parallel light components of Kurematsu would not and could not be transmitted by the wedge of optical fibers of Hegg, since the optical fiber wedge of Hegg negates any special differentiation of the light components in Kurematsu. More particularly, the light components of Kurematsu could not all be transmitted by the optical fiber wedge of Hegg to the AMA since each light component does not and cannot travel in parallel paths. Accordingly, one of ordinary skill in the art would not combine the optical fiber wedge of Hegg with the apparatus described in Kurematsu, since such a combination would defeat the purpose of the apparatus.

Moreover, Kurematsu teaches away from a combination with Hegg. Specifically, Kurematsu, at Col. 7, lines 16-20, notes that the projection display of his invention does not require any moveable parts, such as a rotary color filter. In contrast, Hegg uses such a color wheel 64 (Fig. 1) to temporally modulate the color components of the light to be projected. Thus, one of skill in the art would not look to Hegg since Hegg uses the very temporal differentiation of color which is rejected by Kurematsu. Accordingly, the combination of Kurematsu in view of Hegg is improper and the rejection should be withdrawn.

Whether it may be possible to modify Kurematsu in view of Hegg, the combination does not teach or suggest the elements recited in independent claim 16. Kurematsu and Hegg simply do not disclose or suggest an optical display engine which comprises a microlens array. Rather, Hegg employs a wedge of closely packed optical fibers, which are configured to transmit light only if it enters parallel to the axis of the fibers. The Office Action characterizes the digital micromirror device 76 of Hegg as a

microlens array. This characterization is misplaced. Rather, the micromirror device of Hegg is exactly what Hegg says it is, e.g., an array of micromirrors which do not focus light, but rather reflect light. Kurematsu does not cure this defect in Hegg, since Kurematsu similarly discloses only an actuated mirror array without any microlens array. Accordingly, claim 16 patentably distinguishes over Kurematsu and Hegg, both individually and in combination, such that the rejection under § 103 should be withdrawn.

Claims 17-21 and new claim 28 depend from claim 16 and are patentable for at least the same reasons. Claims 1-5 and 11-15 have been amended to depend from claim 16, and for at least the same reasons, are patentable over Kurematsu and Hegg either alone or in combination. Moreover, Applicant has canceled claims 6-10 and 22-27, consequently, the rejection of these claims is moot. Accordingly, withdrawal of the rejection under § 103 is respectfully requested.

Moreover, dependent claim 21, as amended, further recites an orientation storage system separate from the electrostatic activation electrode to selectively hold the microelectrical mechanical actuators in at least one orientation. Kurematsu simply does not teach or suggest a storage system *separate from the electrostatic activation electrode* as claimed in claim 21. Rather Kurematsu uses a single pixel mirror actuator with an applied actuation voltage to selectively tilt the mirror. In this manner, Kurematsu uses a single drive system to drive the mirror and has no storage system separate from the electrostatic pixel mirror electrodes to selectively hold the actuators in at least one orientation. Accordingly, claim 21 patentably distinguishes over Kurematsu and Hegg, both individually and in combination, such that the rejection under § 103 should be withdrawn.

In addition, the Office Action, at page 2, paragraph 2, mentions that "the crux of the invention lies in the formation of the mirror actuation." To the extent that the Examiner is implying that the point of invention is with the mirror actuation, Applicant respectfully disagrees. As noted in M.P.E.P. § 2141.02, distilling the invention down to the crux of the invention disregards the requirement of analyzing the subject matter as a whole. Accordingly, the invention lies in the elements as claimed, and not in any

particular point of invention. To the extent that the Examiner is presenting his reasons for selecting Kurematsu as the primary reference, Applicant agrees.

Rejections under 35 U.S.C. § 103 – Claim 12

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurematsu, Hegg, and U.S. Patent No. 6,654,156, to Crossland. Without acceding to the propriety of the combination suggested by the Examiner, claim 12 depends from independent claim 16 and is patentable for at least the same reasons set forth above.

Rejections under 35 U.S.C. § 103 – Claims 8, 9, 20, 25, and 26

Claims 8, 9, 19, 20, 25, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurematsu in view of Hegg and U.S. Patent No. 6,353,492, to McClelland et al.[hereinafter McClelland]. Without acceding to the propriety of the combination suggested by the Examiner, claims 8, 9, 19, and 20, as amended, depend from independent claim 16 and are patentable for at least the same reasons set forth above. Applicant has canceled claims 25 and 26 without prejudice or disclaimer, and accordingly, these rejections are moot.

New Claims

Claims 28-47 have been added to further define Applicant's invention. Claim 28 depends from independent claim 16 and is patentable for at least the reasons set forth above.

Independent claim 29 recites, *inter alia*, an electrostatic lock, supported by the substrate and facing the bottom surface of the arm. The lock, when activated by a second voltage, provides an electrical force sufficient to hold the free end of the arm in position. None of the references cited by the Examiner teaches or suggests an electrostatic lock as recited in claim 29. New claims 30-36 depend from independent claim 29 and are patentable for at least the same reasons.

Independent claim 37 recites a method, *inter alia*, activating a selected reflector at a selected row and at a selected column by applying a row voltage to the arm of each reflector in a selected row of reflectors and applying a column voltage to the arm of each

reflector in a selected column of reflectors. None of the references cited by the Examiner teach or suggest a method as recited in claim 37. New claims 38-44 depend from independent claim 37 and are patentable for at least the same reasons

Independent claim 45 recites a microelectrical mechanical device comprising, *inter alia*, at least one electrostatic electrode which when activated by a first voltage, provides an electrical force sufficient to move the free end of the arm. When the at least one electrostatic electrode is activated by a second voltage which is different from the first voltage, the at least one electrostatic electrode provides an electrical force sufficient to maintain a position of the free end of the arm. None of the references cited by the Examiner teaches or suggests an electrostatic electrode as recited in claim 45. New claims 46-47 depend from independent claim 45 and are patentable for at least the same reasons.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, please charge any deficiency to Deposit Account No. 50-0463.

Respectfully submitted,



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Dated:
X03/16/04

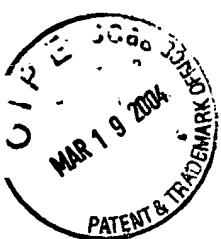


FIG. 21

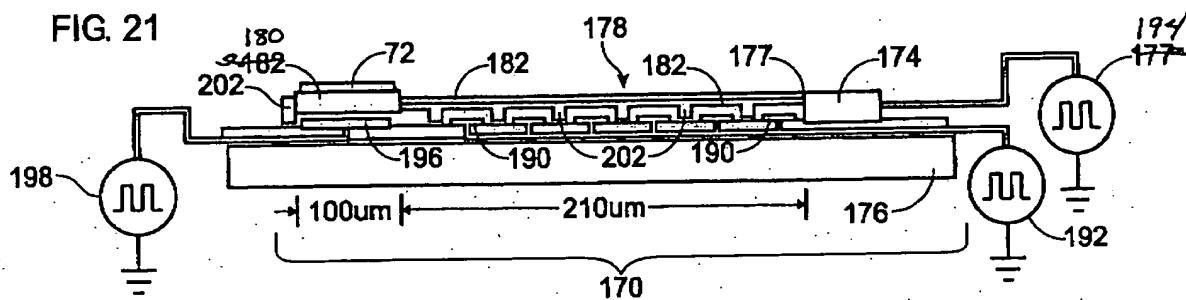


FIG. 22

